National Institute of Environmental Health Sciences

A proposed approach for the assessment of chemicals in indirect potable reuse schemes

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Abstract:

The city of Perth in Western Australia is facing a future of compromized water supplies. In recent years, this urban region has been experiencing rapid population growth, coupled with drying climate, which has exacerbated water shortages. As part of the government strategy to secure water sustainability and to address an agenda focused on all elements of the water cycle, a target of 20% reuse of treated wastewater by 2012 was established. This includes a feasibility review of managed aquifer recharge for indirect potable reuse. A characterization of contaminants in wastewater after treatment and an assessment of the health implications are necessary to reassure both regulators and the public. To date, the commonly used approach involves a comparison of measured contaminant concentrations with the established drinking-water standards or other toxicological guidelines for the protection of human health. However, guidelines and standards have not been established for many contaminants in recycled water (unregulated chemicals). This article presents a three-tiered approach for the preliminary health risk assessment of chemicals in order to determine key contaminants that need to be monitored and managed. The proposed benchmark values for the calculation of risk quotients are health based, systematically defined, scientifically defensible, easy to apply, and clear to interpret. The proposed methodology is based on the derivation of health-based levels for unregulated contaminants with toxicity information and a "threshold of toxicological concern" for unregulated contaminants without toxicity data. The application of this approach will help policymakers set guidelines regarding unregulated chemicals in recycled water. Copyright © Taylor & Francis Group, LLC.

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Resource Description

Communication:

resource focus on research or methods on how to communicate or frame issues on climate change; surveys of attitudes, knowledge, beliefs about climate change

A focus of content

Communication Audience:

audience to whom the resource is directed

Policymaker

Exposure : ☑

weather or climate related pathway by which climate change affects health

Food/Water Quality

Food/Water Quality: Chemical

Geographic Feature: ☑

resource focuses on specific type of geography

Freshwater, Urban

Geographic Location: ☑

resource focuses on specific location

Non-United States

Non-United States: Australasia

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Health Outcome Unspecified

Intervention: ☑

strategy to prepare for or reduce the impact of climate change on health

A focus of content

Mitigation/Adaptation: ☑

mitigation or adaptation strategy is a focus of resource

Adaptation

Resource Type: ☑

format or standard characteristic of resource

Research Article, Research Article

Timescale: ☑

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment: ☑

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content